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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/617,270	07/10/2003	Michael Charles Grady	FA1106USNA	2476

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E I DU PONT DE NEMOURS AND COMPANY
LEGAL PATENT RECORDS CENTER
BARLEY MILL PLAZA 25/1128
4417 LANCASTER PIKE
WILMINGTON, DE 19805

EXAMINER

ASINOVSKY, OLGA

ART UNIT	PAPER NUMBER
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1711

DATE MAILED: 06/23/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/617,270

Applicant(s)

GRADY, MICHAEL CHARLES

Examiner

Olga Asinovsky

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 12 April 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-64 is/are pending in the application.
- 4a) Of the above claim(s) 47-64 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-46 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>Dec. 10, 2004</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Upon reviewing the evidence of record for the present claims, applicant's amendment and applicant's Remarks, the Election/Restriction is made in the present claims because the Group II (see election/restriction below) is related to an apparatus having several means=devices for conveying the monomer(s)/initiator(s) through polymerization apparatus and several means=devices to control temperature and pressure in several reaction zones. The new claim 60 discloses an addition step of rinsing the hybrid reactor and for making an additional grafting step. Claims 61-62 disclose a melt polymerization without solvent. New independent claim 63 discloses a solution polymerization for producing a graft copolymer.

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-46, drawn to a process for producing a polymer, classified in class 525, subclass 310+ depending on the selected monomer.
 - II. Claims 47-59, drawn to a polymerization system=apparatus comprising several means=devices, classified in class 422, subclass 109, 110, 112.
 - III. Claims 60-64, drawn to a process for producing a polymer, this process is different from group I, classified in class 422, subclass varies.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions of Group II and Groups I and III are related as apparatus and product made. The inventions in this relationship are distinct if either or both of the following

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can be shown: (1) that the apparatus as claimed is not an obvious apparatus for making the product and the apparatus can be used for making a different product or (2) that the product as claimed can be made by another and materially different apparatus (MPEP § 806.05(g)). In this case the product as claimed can be made by another and materially different apparatus such as an extruder.

3. Inventions of group III and Group I are unrelated. Inventions are unrelated if it can be shown that they are not disclosed as capable of use together and they have different modes of operation, different functions, or different effects (MPEP § 806.04, MPEP § 808.01). In the instant case the different inventions have different functions because the process in claim 60 is requiring an addition step for making grafted polymer. Claims 61 and 62 disclose a high temperature polymerization that could include a melt polymerization without a solvent. Independent claim 63 discloses a solution polymerization for producing a graft copolymer.

4. Because these inventions are distinct for the reasons given above and the search required for Group I is not required for Group II and Group III, restriction for examination purposes as indicated is proper.

5. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

6. During a telephone conversation with Sudhir Deshmukh on June 15/16, 2005 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-46. Affirmation of this election must be made by applicant in replying to this

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Office action. Claims 47-64 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Claims 1-46 disclose a process for producing a polymer.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-3, 5-8, 10-12, 16-21, 24-33, 36-46 are rejected under 35 U.S.C. 102(b) as being anticipated by Prentice et al U.S. Patent 5,171,768.

Prentice has been considered in the office action mailed on 10/26/2004 and it is incorporated here by reference.

Prentice discloses a method of producing carboxylated latex composition comprising a step of polymerizing a mixture of monomer(s) and an initiator at a temperature and under constant pressure, column 5, line 24 and column 7, line 55. The process is carried out in a batch or semi continuous process, however, due to economic and production reasons the process is preferably carried out on a continuous basis, col. 5, lines 11-21. Preferably, the process is carried out in a chain consisting of four continuous stirred-tank reactors, col. 5, line 21. The stirred tank reactor is the same that

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a hybrid reactor or batch reactor in applicant' claims 1, 9, 20. In the first polymerization stage the partially polymerized latex of conjugated diene and styrene is produced. The partially polymerized latex is readable in applicant' claimed polymerization of a portion of the monomers in a first polymerization zone. Other functional monomers can be included in the process to effect certain polymerization and application properties, column 2, lines 63-65. The polymerization can be made in the aqueous phase, column 3, line 68, for the polymerization medium in the present claims. The process is carried out under constant pressure of 130-210 psig, column 5, line 24. In the working example 1 at column 6, a constant pressure is approximately 45 to 75 psig. The partially polymerized latex is removed from the first reaction zone to the second reaction zone with an addition conjugated diene and an initiator for producing a copolymerized latex, column 6, lines 1-25. The first reaction zone has a temperature condition in the range of 65 to 85 C, the second reaction zone has a temperature higher for being at 75 to 93 C, column 5, lines 26-29. Reference discloses a process for producing the copolymer latex in at least two reactors such that the polymerization conditions are controlled by the temperature and pressure. The polymerization process conditions are readable in applicant's claims. Claimed hybrid reactor and a batch reactor in the present claim I is a stirred tank that is claimed in the present claims 9 and 20. Prentice discloses a stirred tank reactor, col. 5, line 21. The monomer(s) conversion in to a polymer during the continuous polymerization in each zone is gradually increased from 3 to 12% to about 70 to about 99%. The copolymerization is completed until a final conversion of from about 80 to about 100 % is achieved, col. 6, lines 25-35.

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The terms "sub-reflux condition" in the first polymerization step and a "reflux condition" in the second polymerization stage are inherent in the process of making a latex in Prentice invention because reference discloses the same steps, the same process conditions, the same reactor and the high rate monomer conversion. The polymerization process under temperature and pressure in the stirred-tank reactor includes any available means=devices to control the temperature and pressure in each reaction zone. Thus, a "gage pressure" is also inherent in Prentice invention. It is well known that a pressure is a function of the temperature. Worker in the art knows how to control the pressure and temperature during the polymerization process.

Response to Amendment

9. Applicant's arguments filed 04/12/2005 have been fully considered but they are not persuasive.

10. The argument that applicant discloses utilizing the hybrid/batch reactor combination is not persuasive since the hybrid and batch reactors are the same stirred tank reactor that is readable in Prentice's invention. The polymerization of portion of monomers into the polymer under effective temperature and sub-reflex polymerization gage pressures is readable in Prentice for the partially polymerized latex in the first reaction zone. The applicant's argument that "the hybrid reactor is provided monitoring and controlling devices to control pressure within the hybrid reactor" is readable in Prentice since reference discloses the same stirred-tank reactor, wherein any monitoring and controlling device is inherent as being a type of equipment of the same

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reactor. The present claims can include any monomer(s), and any initiator(s). All independent claims disclose a process for polymerization a polymer wherein said polymerization process can be a solution polymerization process or a melt polymerization process without a polymerization medium. The aqueous polymerization in Prentice is readable in the present claims 1, 3 and 16. Any amount of initiator(s) can be present in any polymerization zone in the present claims. There is no requirement in the present claims of the rate conversion of monomer(s) into a polymer. There is no desired polymer property having low polydispersity.

Claim Rejections - 35 USC § 103

11. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. Claims 1-59 are rejected under 35 U.S.C. 103(a) as being unpatentable over Berge et al U.S. Patent 5,362,826 in view of Prentice et al U.S. Patent 5,171,768.

Berge discloses a method of producing macromonomer composition comprising a step of polymerizing a mixture of monomer(s) and an initiator at a temperature and under nitrogen positive pressure, column 10, lines 34-60 and column 12, line 54. A reactor was equipped with a stirrer, thermocouple and condenser, col. 12, lines 52-53. This

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reactor can be considered as a stirred-tank reactor. The polymerization can be carried out in the presence of a polymerization medium, including organic solvent, column 11, lines 28-30. A chain transfer catalyst can be employed in the polymerization process, col. 9, line 12 and col. 13, line 42. The catalyst specified in the present claims 34 and 35 is readable in Berge invention. The polymerization can be carried out in a batch, semi-batch, continuous or feed process, col. 10, lines 56-57. The pressure was applied to avoid monomer reflux. The step of producing a macromonomer of the polymerized latex is equivalent to a step of making a polymerized portion of monomers into polymer under sub-reflux polymerization conditions in applicant's claims. Berge discloses that it is possible to produce terminally functional macromonomers for producing a higher degree functional terminated polymer, column 11, lines 63-68. Therefore, a second polymerization process can be applied in Berge's invention. Berge discloses that a polymerization process conditions will depend on a variety of factors, including the monomers being polymerized, the particular chain transfer agent, the initiator, the amount of the ingredients and temperature, pressure and conversion, col. 19, lines 45-49.

The difference between the present claims and Berge is the requirement in the present claims of a second copolymerization stage to cause polymerization of a remaining portion of monomers from the first stage with said polymer produced in the first stage under reflux conditions.

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Prentice has been discussed in the paragraph 8 above.

It would have been obvious to one of ordinary skill in the art to modify the process of producing macromonomer composition in Berge's invention by a continuous polymerization of said macromonomer with addition monomer(s) in the second polymerization stage as disclosed by Prentice because any additional functional monomer is recognized by Berge, col. 11, lines 65-68.

Conclusion

2. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Applicant's election/restriction was made without traverse. Reference to Prentice's 5,171,768 has been considered under 35 U.S.C. 103(a) in the previously office action. Since the anticipating is, the new rejection is set in this office action under 35 U.S.C. 102(b) as being anticipated by Prentice's 5,171,768.

3. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a).

Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

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the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Olga Asinovsky whose telephone number is 571-272-1066. The examiner can normally be reached on 9:00 to 5:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, James Seidleck can be reached on 571-272-1078. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



June 18, 2005

Olga Asinovsky
Examiner
Art Unit 1711



James J. Seidleck
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